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March 13, 1998

BY HAND DELIVERY

Magalie Roman Salas, Secretary
Federal Communications Commission
1919 M Street, N.W.
Room 222
Washington, D.C. 20554

Re: *Ex Parte* Presentation in CC Docket No. 97-211

Dear Secretary Salas:

Transmitted herewith on behalf of WorldCom, Inc. and MCI Communications Corporation and pursuant to Section 1.1206(a) of the Commission's Rules, 47 C.F.R. § 1.1206(a) (1996), this is to provide an original and one copy of a notice of an *ex parte* presentation made yesterday afternoon in the above-referenced rulemaking proceeding on behalf of WorldCom, Inc., by Martina Knee, Robert Koppel, and the undersigned, and MCI Communications Corporation, by Larry A. Blosser, Sanford Reback and Paul Rothstein. These WorldCom and MCI participants met with Michelle Carey and Eric Bash of the Policy and Program Planning Division of the Common Carrier Bureau, James Earl and Matthew Nagler of the Competition Division of the Office of General Counsel, Stagg Newman and Patrick DeGraba of the Office of Plans and Policy, and Helen Domenici, Adam Krinsky, Joanna Lowrey, and Rebecca Arbogast of the International Bureau to discuss various Internet issues which have been raised in the filings of a number of parties to this proceeding, and addressed by WorldCom and MCI in their filings. A copy of the written materials which were provided to the Commission participants is attached hereto for the record.

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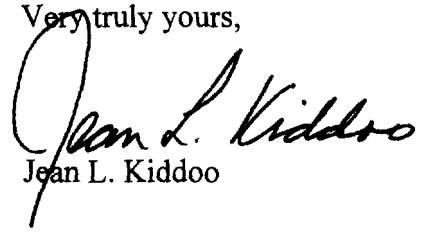
Should any further information be required with respect to this *ex parte* notice, please contact the undersigned. I would appreciate it if you would please date-stamp the enclosed extra copy of this filing and return it with the messenger to acknowledge receipt by the Commission.

Very truly yours,



Jean L. Kiddoo

Enclosures

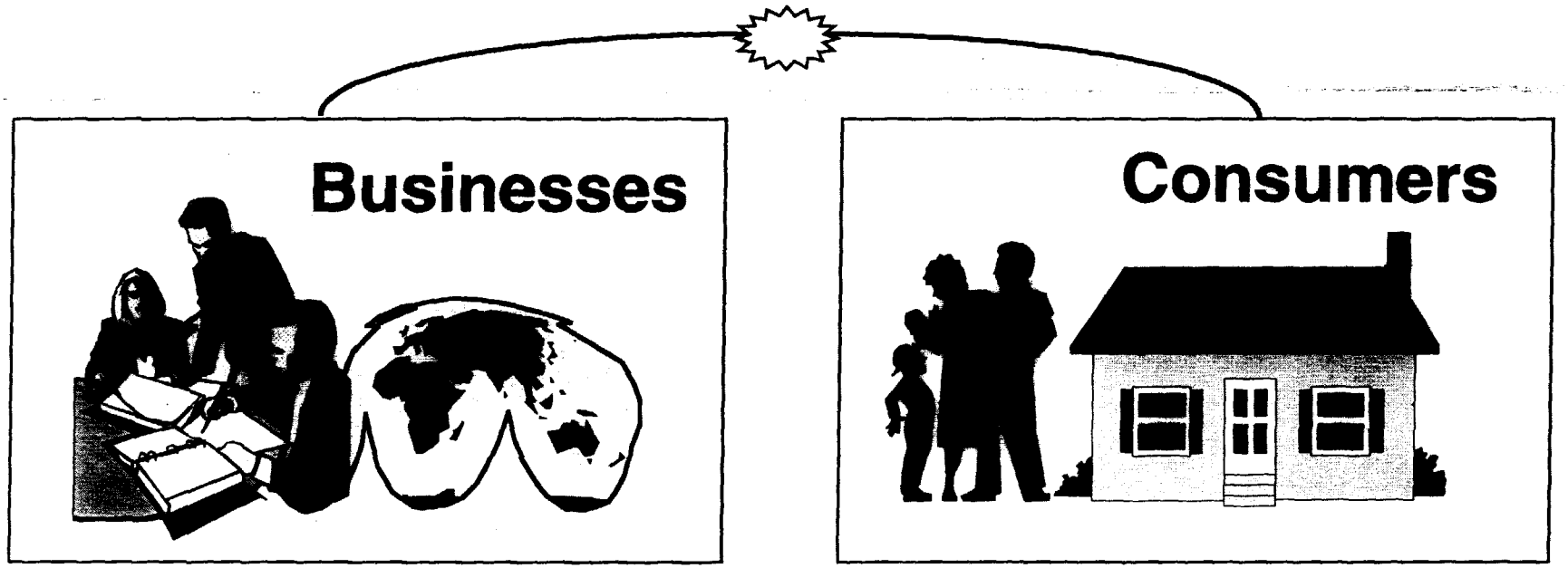
cc: Michelle M. Carey and Eric Bash
Policy and Program Planning Division, Common Carrier Bureau
James Earl and Matthew Nagler
Competition Division, Office of General Counsel
Stagg Newman and Patrick DeGraba
Office of Plans and Policy
Helen Domenici, Adam Krinsky, Joanna Lowrey, and Rebecca Arbogast
International Bureau
Martina Knee and Robert Koppel
WorldCom, Inc.
Larry A. Blosser, Sanford Reback and Paul Rothstein
MCI Communications Corporation

WorldCom Internet Presentation

March 12, 1998

The Internet ... A Cooperative Interconnection of:

- Thousands of networks
- Millions of servers (computers)
- Tens of millions of users



The Internet

- **Unprecedented growth:**

Number of North American ISPs	Date	Number of U.S. National Backbone Operators	Date
1447	February 1996		
2266	May 1996	9	Summer 1996
3068	October 1996		
3640	February 1997		
3747	April 1997	22	May 1997
4009	June 1997		
4354	October 1997	37	Fall 1997

Source: Boardwatch Magazine, Fall 1997

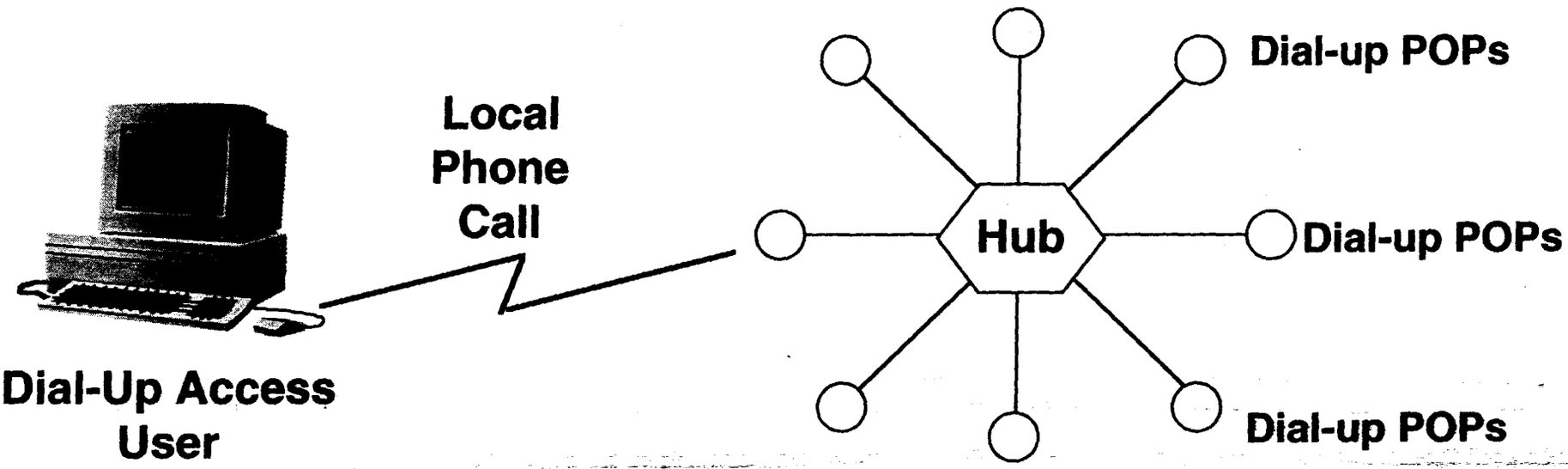
- **Changing the structure of the communications industry**
- **Changing the structure of the industrial world and evolving new models for commerce, entertainment, education, etc.**

The Internet and The Communications Industry

Growth: Internet Capacity Demand	= 1,000% per year
Voice Demand	= 10%+/- per year

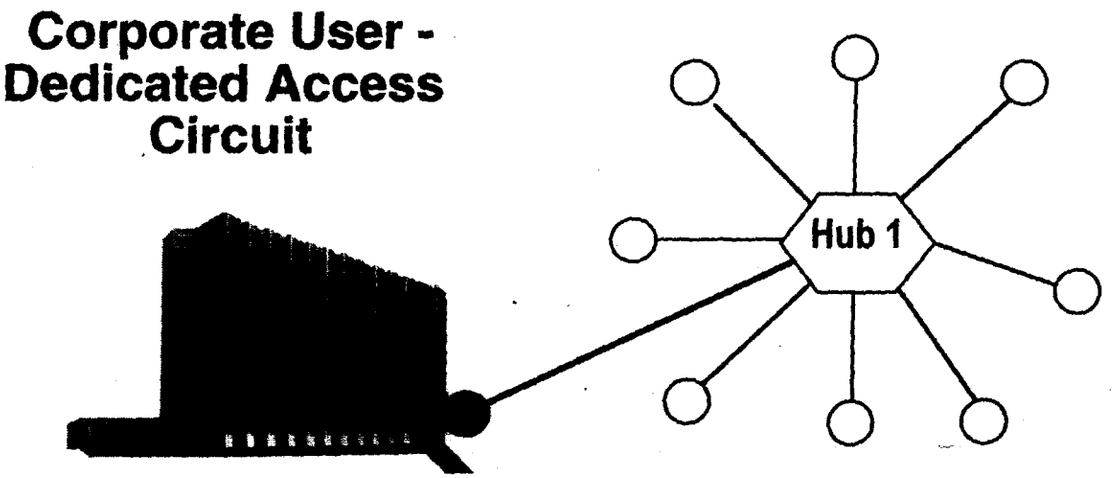
- Totally changes the communications industry
- Every communications company must participate in the Internet .... or face an uncertain future
- Competition will be fierce
- Entry is easy for communications companies and continued entry is expected

Dial-Up Access To The Internet



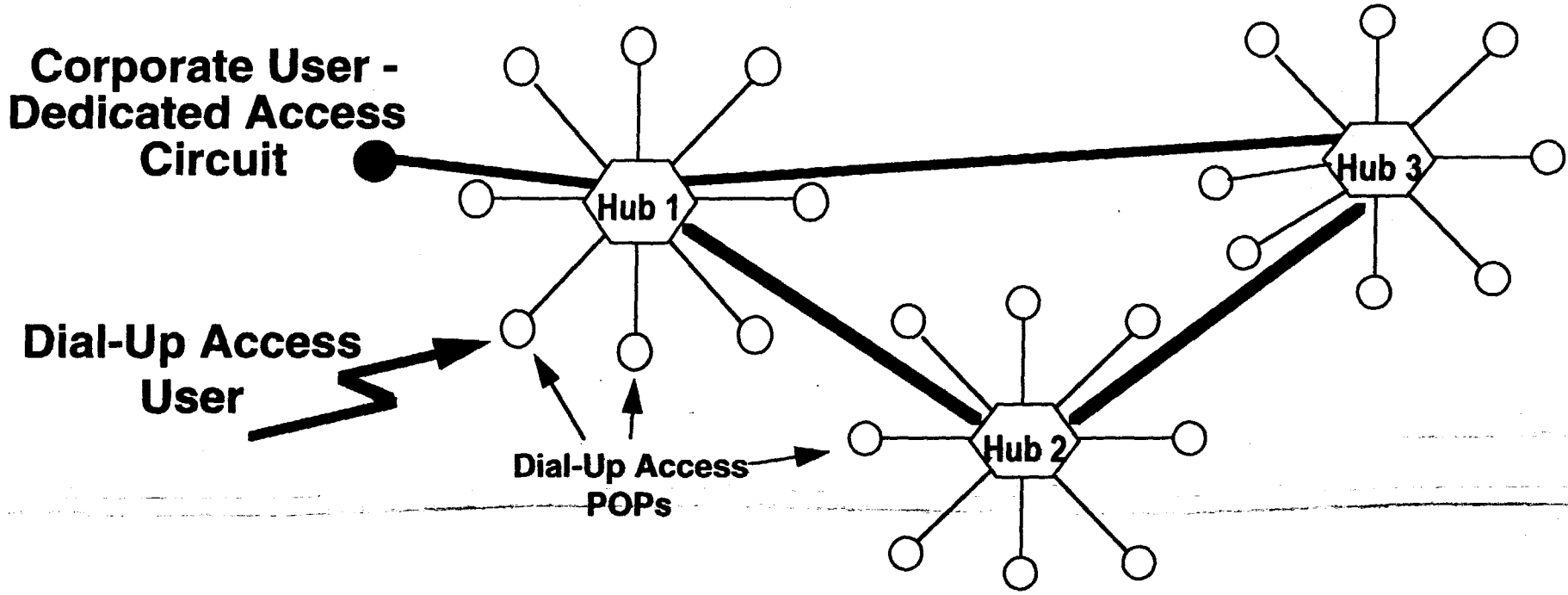
- Dial-up access POPs across the U.S. provide local phone call access to the Internet
- Caller connects to a modem port on a platform owned by an ISP or dial-up access network provider...
- Routers and switches owned by the ISP send the caller's packets to the appropriate destination .... through backbone networks....

Dedicated Access to the Internet



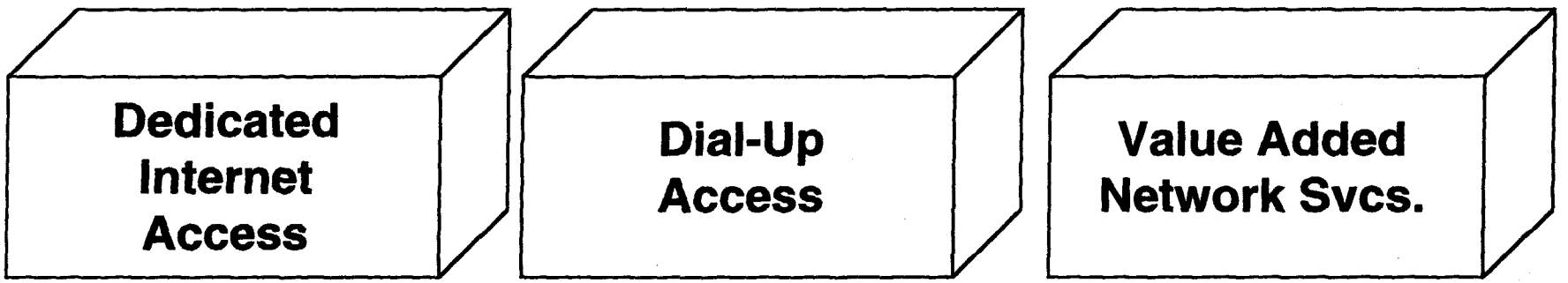
- Dial-up access "POPs" and "dedicated access" circuits connect to "high speed hubs" across the U.S.

Internet Backbone Network



- Dial-up access "POPs" and "dedicated access" circuits connect to "high speed hubs" across the U.S.
- Routers and switches owned by the ISP send the packets to the appropriate destination
- High speed circuits, leased from or owned by Telcos, interconnect the "high speed hubs" forming an "Internet backbone network"

Current Internet Services

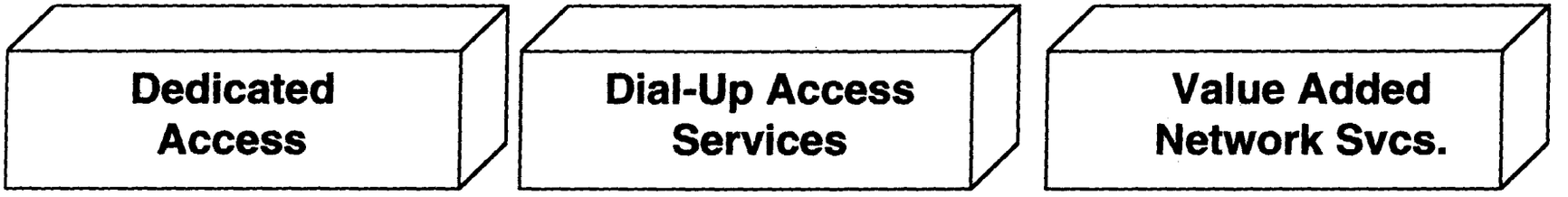


- Dedicated Internet connections
- Sold directly to businesses and wholesale thru ISP resellers

- Dial-up modem access
- Connectivity through national backbones
- Sold on wholesale basis to consumer service providers for resale to consumers

- Specialized networks
- Corporate Intranets
- Customized network services (web design, hosting)
- Sold directly to businesses

Service Providers



Dedicated Access

- **Current**
  - AGIS, AT&T, Cable & Wireless, Digex, GTE/ BBN, IBM, ICG/ Netcom, MCI, PSI, Sprint, TCG/CerfNet, UUNET + many others
- **Future**
  - Williams, Level 3, Qwest
  - All RBOCs
  - Cable TV companies (e.g., @Home)
  - Utility companies
  - Satellite (Teledesic)

Dial-Up Access Services

- **Current**
  - ANS, Cable & Wireless, CompuServe, Earthlink, Epoch, GTE/BBN, IBM, ICG/Netcom, MCI, PSI, RBOCs, Sprint, TCG/ CerfNet, UUNET + many others
- **Future**
  - All RBOCs
  - Cable TV companies (e.g., @Home)
  - Utility companies

Value Added Network Svcs.

- **Current**
  - All RBOCs, AT&T, CompuServe, EDS, GEIS, GTE/BBN , IBM, Infonet, MCI, SITA (Scitor), Sprint
- **Future**
  - All major system integrators

Currently approx. 4300 U.S. ISPs....

Multihoming is Easy

- Obtaining dedicated access from two Internet backbone services providers is easy for ISPs and end users
  - ISP customer gets address from first provider or ARIN
  - Both providers announce address
  - Routers are configured to determine the paths
  - ISP customer can determine and alter preferred routes
  - Obtaining second connection takes no longer than obtaining first connection

Switching ISPs Is Easy

- ▲ Dial-Up Service
  - Retail
  - Wholesale
- ▲ Dedicated Access
  - Retail
  - Wholesale

- o Internet Service Provider
- o IP Addresses
- o Contract Terms
- o Telco Circuits

Market Perspective - Internet

- Market share statistics are inconsistent and impossible to verify; imperfect measurements
- Revenues are the most accurate of the measurements
- Frost & Sullivan study (1996) estimates U.S. Internet access market size at $2.3B for 1996
- Forrester Research study (May 1997) shows top 5 ISPs with 39% market share
- Forrester Research study (May 1997) shows 11% of Fortune 1000 companies interviewed said UUNET was their ISP
- We believe studies showing 100% growth for 1997. Therefore... $4.6B in U.S. revenues in 1997... WorldCom + MCI = 21%

Other "Measurements"

- Route entries: WorldCom + MCI 22.43%
- Allocated IP address space: a valid measurement?
- Traffic: Since April 1995, it has not been possible to measure traffic flow over the Internet.*
- Number of ISP Connections: WorldCom + MCI ?48.3%?**
  - Unverifiable
  - Methodology?
  - Double counting?
  - "Snapshot"
  - Relationship to Revenues

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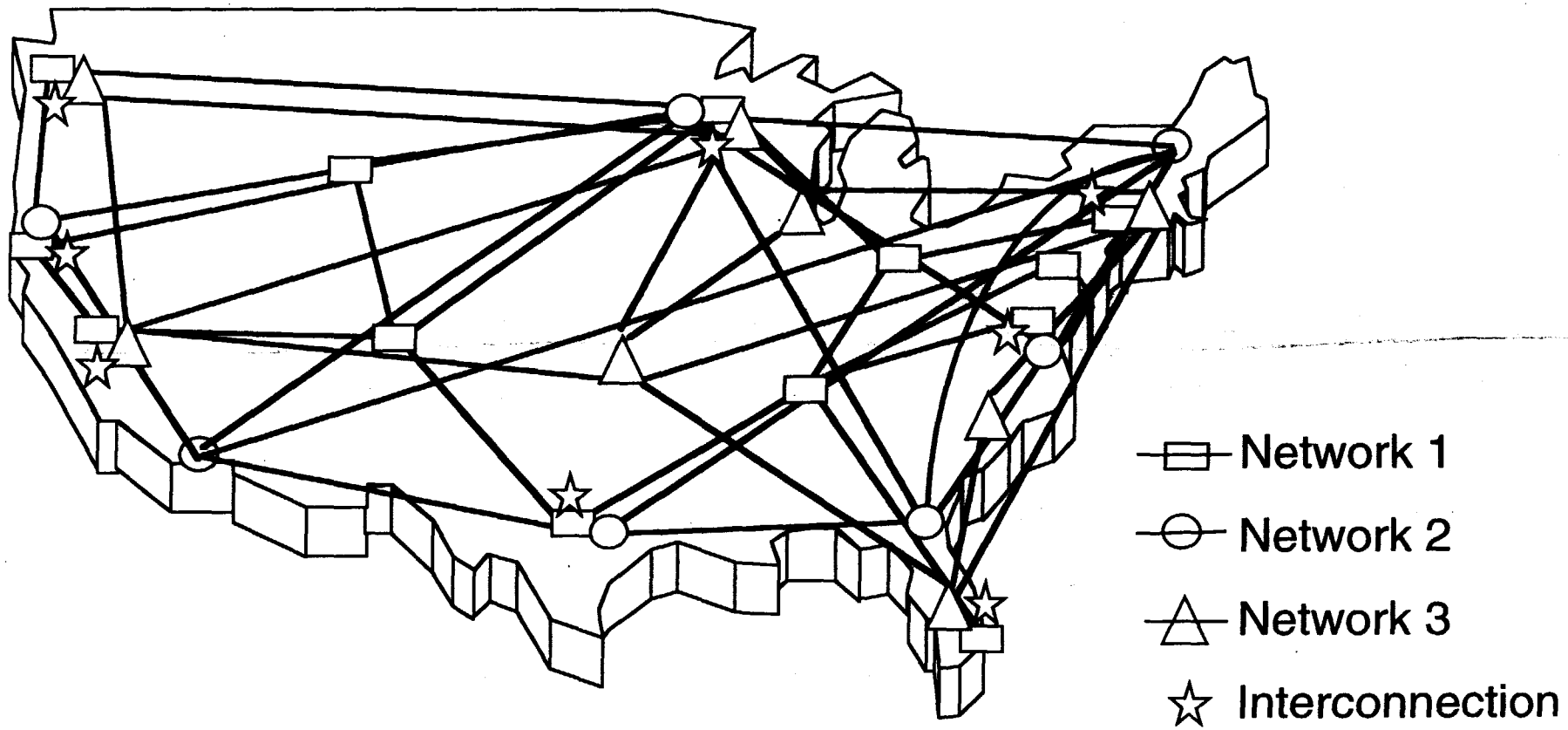
* See www.merit.edu/nsfnet/statistics/history.bytes. See also Matrix Information and Directory Services (MIDS), January 1997 MIDS Internet Market Report.

* Boardwatch Magazine, Fall 1997.

Internet... Interconnected Networks



IP Addresses

- What is an IP Address?
- Internet Assigned Numbers Authority (IANA) Makes the Rules
- American Registry for Internet Numbers in the Americas (ARIN) Administers the Rules in the U.S.
- ISPs Follow the Rules and Communicate Them

NAPs and MAEs

- NAP: Network Access Point
- MAE: Metropolitan Area Ethernet
  (A NAP run by WorldCom)
- 1995: 5 NAPs - MAE East, MAE West, NY (Sprint), Chicago (Ameritech) and Palo Alto (Pac Bell) (per NSFnet bidding process)
- 1998: 39 U.S. MAEs and NAPs; new entrants at a consistently fast rate (7 U.S. MAEs today operated by WorldCom, MCI does not operate any NAPs)

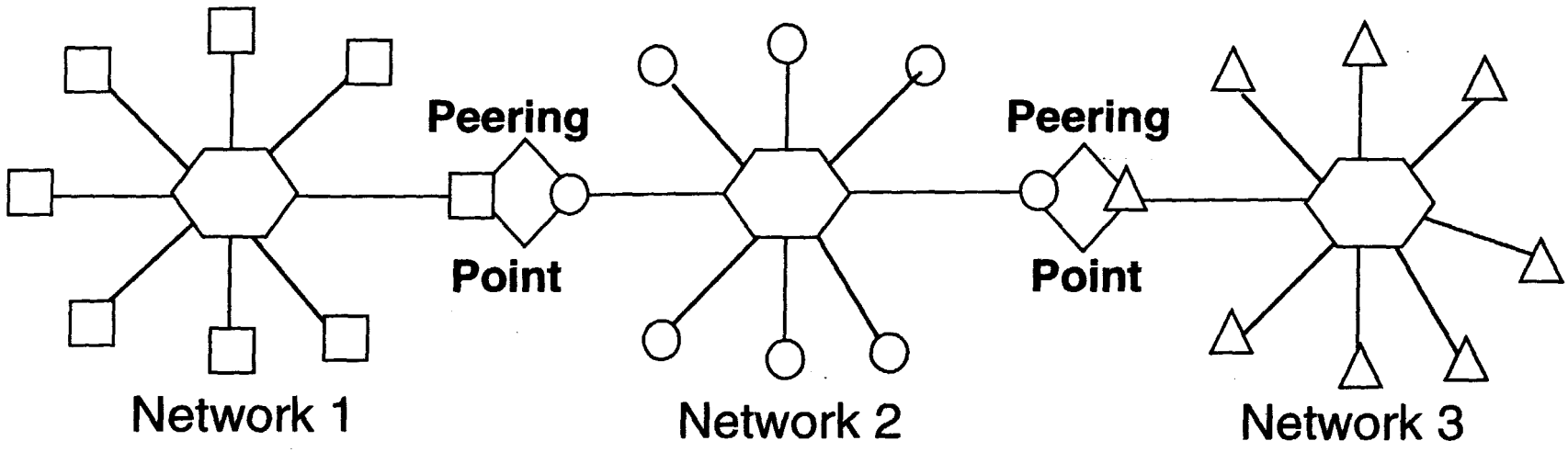
What is a NAP/MAE?

- Operated by telcos and others (e.g., Sprint, Pac Bell and DEC)
- A facility that provides services to ISPs: connectivity to the NAP/MAE, colocation space, switching platform used for interconnection
- Is not a substitute for an ISP
- Does not compete with ISPs
- Does not "provide peering" - provides access to the medium over which peering ISPs exchange data
- Does not route data

MAE History/Technology

- 1992, Ethernet port
- 1993, Switched Ethernet
- 1994, Shared FDDI
- 1995, Switched FDDI
- 1996, Multiple FDDI Switch
- 1997, Hierarchical Switched FDDI
- 1998, ATM

What Is Peering?



- Peers exchange traffic with each other at no charge
- Connections established in multiple ways .... from robust peering at direct peering points or by establishing "minimal" connections (via BGP sessions) at "public peering" points (e.g., MAE East & West, NAPs)
- Peering agreements DO NOT allow transit. You can reach any address (or customer) on your peer's network .... but cannot reach any other Internet networks through that peer

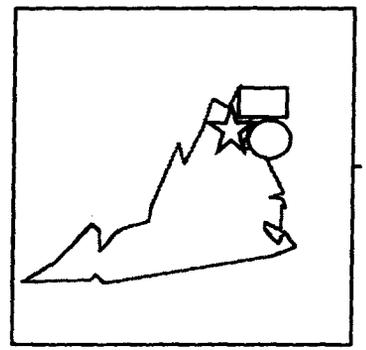
ISPs typically require 50-70 peering agreements to avoid delivery default

Internet - Interconnection

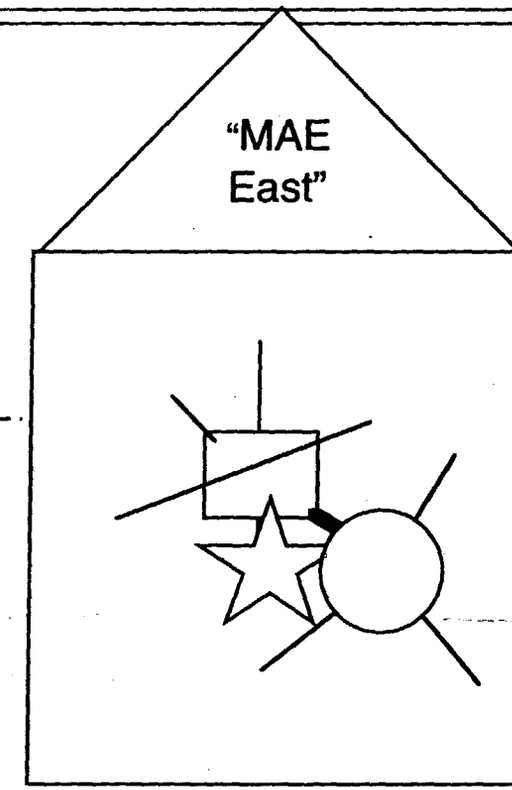
"Public" Peering

at MAE/NAP

Washington D.C.



"MAE East"



MAE provides:

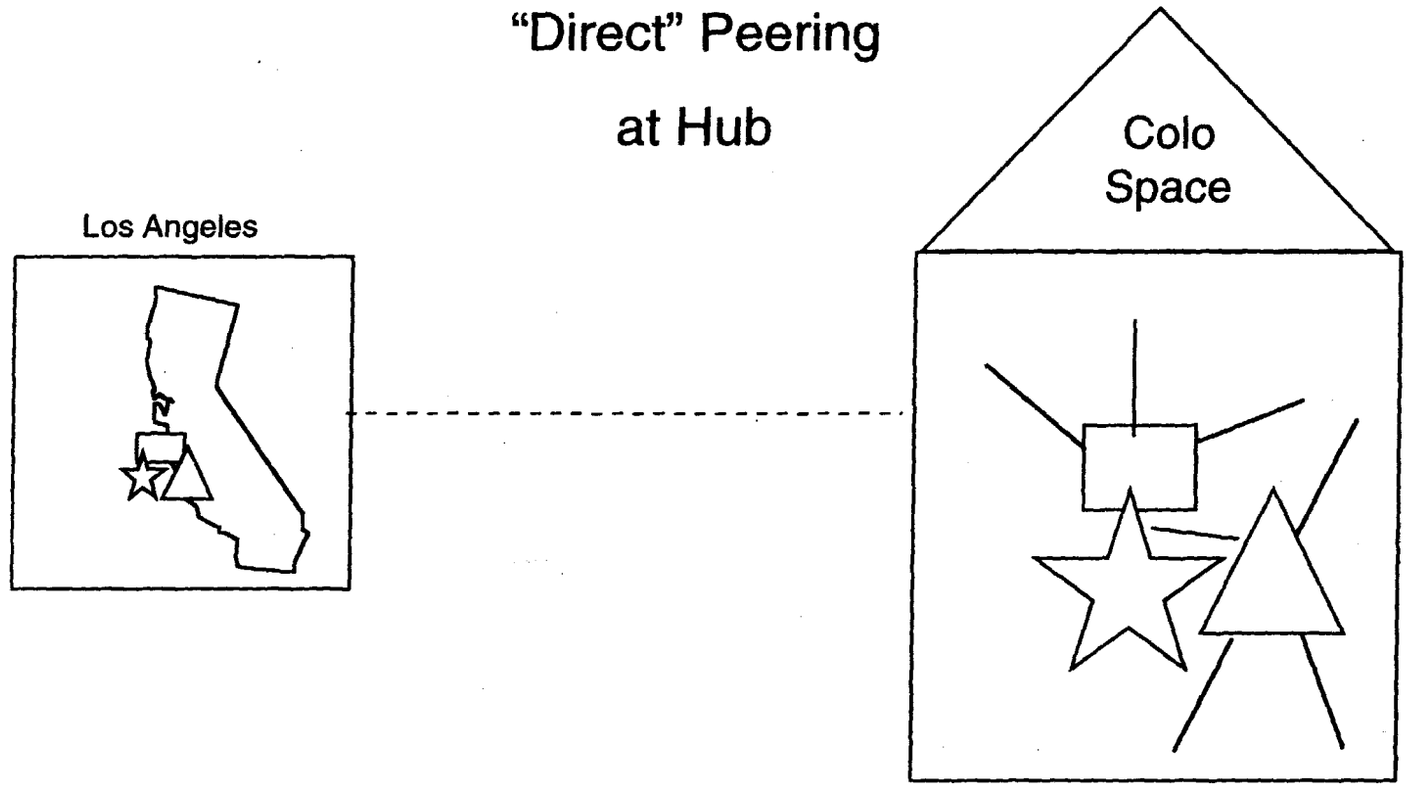
- **Colocation Space**
- **Connectivity**
- **Switching Facility**

Peers enter into peering arrangement

Internet - Interconnection

"Direct" Peering

at Hub

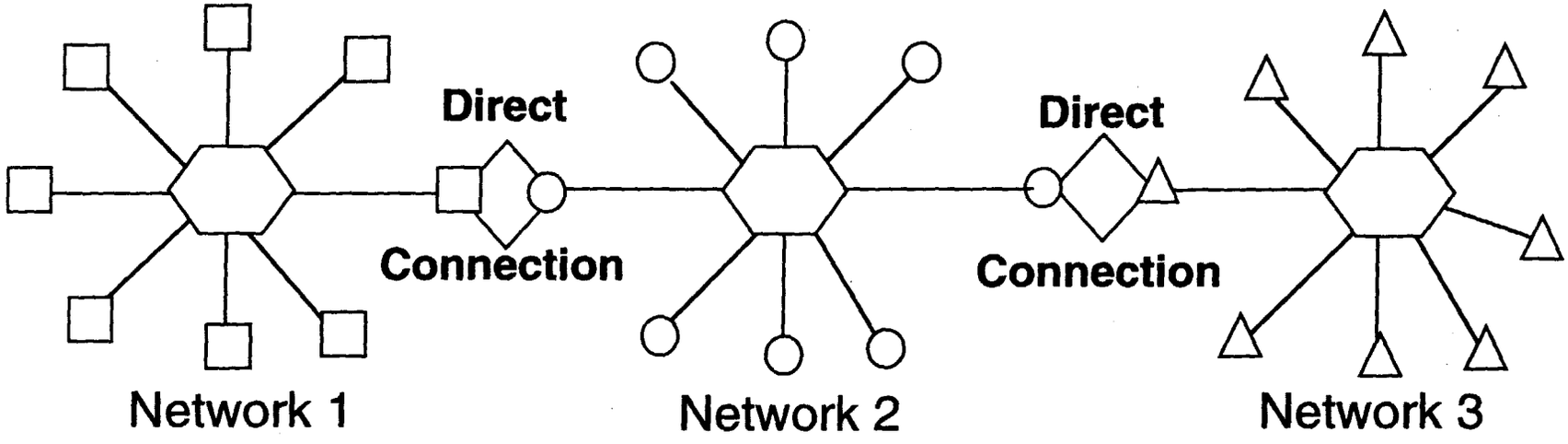


Each peer obtains own:

- **Colocation Service**
- **Connectivity**

Peers enter into peering arrangement

ISP Dedicated Access Connection



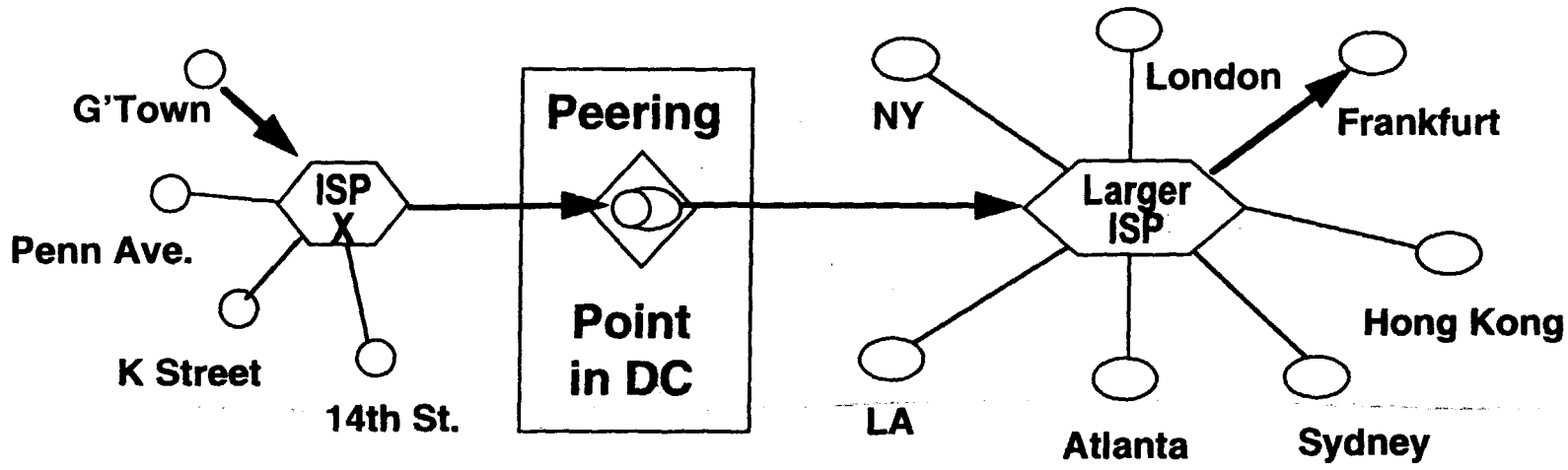
- Network 1 and Network 3 pay Network 2 for Internet access and other services
- Charge is typically based on size of the connection (bandwidth) and may also be usage sensitive
  - Typical T-1 agreement = $1,000-$3,000/month
- Dedicated access customers receive other services (SMTP mail, News, DNS, NOC support, provisioning assistance, etc.)
- Dedicated access agreements provide access and transit
- Dedicated access customers can reach any Internet destination on any Internet networks connected to provider (effectively all)

Customer ISPs get complete access to all Internet networks via dedicated access agreements with any backbone services provider

The Economics of Peering

A small provider (X) with a local network in Washington D.C.

Large Worldwide Provider



1. Users in Washington dial locally to X's POP .... sending information to user of larger ISP in Los Angeles or Frankfurt

2. .... if peered, X hands off traffic to larger ISP in Washington incurring NO COST other than local charge. larger ISP must then carry the traffic to Frankfurt via its worldwide network

3. .... if traffic comes from a larger ISP user in Frankfurt, larger ISP carries traffic through its network from Frankfurt to Washington and hands off the traffic to X user in Washington .... who has (again) only the local Washington cost